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ABSTRACT

This paper, written by an official in the U.S. Soil Conservation Service, describes that status of Environmental Education (EE) in the United States. An introduction presents some background considerations and philosophies in EE. The second section presents emerging trends in science education. Some of these trends are in part drawn from the National Science Teachers Association's (NSTA) "Scope, Sequence, and Coordination of Secondary School Science" effort-called the CORE Content. Those applicable to EE are enumerated and discussed. The NSTA model has four goal clusters which are humanistic in their philosophy: personal needs, societal needs, academic population, and career educators/awareness. The last section provides a brief review of some EE efforts in the United States. The paper suggests that the following should be among these shared goals: (1) stressing environmental and human interrelationships; (2) infusing the environment into all academic topics; (3) making sure that EE programs are educational and objective; (4) teaching about all natural resources equally; (5) reorienting teacher training to include how to infuse EE into all topics; (6) making teachers aware of the availability of resources; and (7) articulating clearly the results of EE. (Contains 9 references.) (MCO)

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"THE STATUS OF ENVIRONMENTAL EDUCATION IN THE UNITED STATES"

PRESENTED BY

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**SEPTEMBER 9, 1992
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Good day.

The challenge of describing environmental education in the United States is, indeed, formidable. The number of private organizations, schools, individuals, and government agencies involved in environmental education is immense. I'm not sure if there ever has been, or could ever be, an accurate accounting of the magnitude of the effort.

Considering the many potentials for this presentation, I would like to focus on three areas: first, providing some background considerations and philosophies; second, describing emerging trends in science education; and third, outlining several environmental education efforts underway in the United States

BACKGROUND AND PHILOSOPHY

Education is in constant transition, providing environmental educators opportunities to become a part of mainstream education. Mainstreaming environmental education has always been difficult to achieve, but it must be addressed as you build your programs. Environmental education should not be thought of as "another" topic in the school system, but as a regular part of the academic program. To achieve that, it will require a complete rethinking of how teachers are trained at the university level, and how schools actually approach the teaching of all academic subjects.

Mainstreaming is the ultimate challenge to environmental educators. It requires implementing philosophically, economically, and educationally-sound programs to demonstrate clearly its value to the overall academic achievement of students.

The questions are: "Where and how does environmental education fit into the total educational matrix?"; and "How can environmental education provide important lifetime learning experiences that develop a personal conservation ethic?"

One thing is certain, there is increased understanding that education about and with the environment is important and necessary. Yet, it is impractical to think that environmental education will always remain at the top of the public's agenda of important issues. Historically, issues

are cyclical in nature, and their return to the "top spot" of public attention is assured. To be successful, we must work continuously to keep environmental education alive and healthy by developing a strong philosophy and by working to infuse environmental education concepts, principles, and programs into all academic topics and teacher training. In other words, mainstreaming.

Environmental education has long been considered science-based, yet in both the human and environmental worlds, nothing stands in isolation. Consequently, environmental education must be considered interdisciplinary. It must be infused in all academic topics, reflecting not only knowledge about the environment, but how the environment impacts humans, and how humans impact the environment.

As the naturalist John Muir said, "When we try to pick out something by itself, we find it hitched to everything else in the universe."

Using the idea that everything is hitched to something else, the foundation of environmental education programming could be formed. That concept provides one of the strengths of environmental education and is based on economy of scale . . . trying to achieve many objectives by using as few resources as possible; developing the human and environmental interrelationships; and then building on them throughout the entire academic program.

In any educational endeavor, employing a hands-on approach to learning is the most successful. Consequently, teachers should involve students in activities that require use of the senses -- touch, smell, hearing, sight, and taste.

Environmental education could be used to counter the comment of Tom Benjamin, Staff Leader, Alliance for Environmental Education, who summed up the American education problem by saying, "It is directed toward mediocrity."

EMERGING TRENDS

In 1976, the United States Department of Education's Federal Interagency Committee on Education prepared a wonderful document called Fundamentals of Environmental Education, in which four "basics" were described. They are:

- (1) The Earth's environment is a whole;
- (2) The ecosphere is a dynamic, constantly-changing macro-system -- a mosaic of ecosystems;

- (3) The energy and materials necessary for all life are components of each ecosystem; and
- (4) Each ecosystem includes a number of species populations.

As you develop your environmental education program, you must link one, some, or all of these fundamentals to your activities.

The National Science Teachers Association (NSTA), based in Washington, D.C., has developed its "Scope, Sequence and Coordination of Secondary School Science" effort -- called the CORE Content -- which introduces four special elements for consideration. They are:

- (1) Spaced learning, where teachers present fundamental science concepts over years, not weeks;
- (2) Repeated experiences in different contexts to assist students in building concepts;
- (3) The introduction of science phenomena prior to the students introduction to the terminology; and
- (4) The encouragement and evaluation of student learning as depth understanding, not as memorization of facts, terms, or bits of unconnected information.

This education reform package will help students answer the questions of science, not by presenting assertions of authority-determined answers, but by allowing the students to "own" ideas, concepts and information. Consequently, teachers will encourage students to ask:

- How do we know?
- Why do we believe?
- What does it mean?

The NSTA draft outline states, "The CORE Content alone will not motivate science concepts, or to think clearly and logically. How curriculum writers use the CORE Content, how teachers assess the learning that occurs, and how willing teachers are to forego cherished topics will all affect student learning outcomes."

A challenge is designing and implementing an integrated and coordinated science program requiring "Renaissance people". Yet, in many educational systems, specialists -- not "Renaissance people" -- design science textbooks and administer the school system. "Thus", continued the report, "reformers must be aware that their objectives may not find the desired expression in textbooks."

In the United States, teachers are becoming increasingly disillusioned by textbooks and are seeking outside, or supplemental, materials to help reach their mandated educational objectives. Organizations, public and private, have a wealth of knowledge stored in technical documents, popular publications, and in the collective minds of their employees.

Two related questions arise: (1) How do we convince organizational leaders to unleash these resources for use by educators?; and (2) How do we inform educators of the availability of these organizations and their resources?

The NSTA model also provides four goal clusters, which are humanistic in their philosophy:

- (1) Personal Needs -- Science education should prepare individuals to utilize science for improving their own lives and for coping with an increasingly technological world.
- (2) Societal Needs -- Science education should produce informed citizens prepared to deal responsibly with science-related societal issues.
- (3) Academic Preparation -- Science education should allow students who are likely to pursue science academically, as well as professionally, to acquire the academic knowledge appropriate for their needs.
- (4) Career Education/Awareness -- Science education should give all students an awareness of the nature and scope of a wide variety of science and technology-related careers open to students of varying aptitudes and interests.

Although the focus of the NSTA report is science education, the concepts are applicable to all academic areas and parallels a movement in the social studies community.

These changes in education will impact all areas of the formal education experience. And it will certainly change some teachers methods. Charles Dickens reported that his schoolmaster said, "Now what I want is, facts". In today's world, made smaller by instant communications, students require more than facts; they need information and experiences relevant to successfully functioning in modern society. And teachers need programs, materials, and a working atmosphere that are equally up-to-date.

U.S. EDUCATION EFFORTS

A review of environmental education efforts in the United States will touch on only a few of the literally thousands of programs and activities underway.

Funding

Funding is always a topic of interest. Besides receiving money from regular operating funds, many of our states have developed unique ways to generate revenue for their environmental education efforts. To name just a few of the more interesting methods, some states have imposed new or additional fees on automobile licenses, solid waste dumping, utilities, donations and grants, auto emission inspections, severance taxes, trust fund investments, and lotteries. Others have increased "sin" taxes on tobacco and alcohol.

Programs

In January 1992, the Governor's Task Force on Environmental Education in Arizona completed its work and presented a comprehensive report to Governor Fife Symington. The report provided five goals and 14 objectives for environmental education in the state of Arizona.

The five goals recommended to the Governor were:

- (1) Each individual should have a basic understanding of environmental sciences.
- (2) Each individual should understand the interrelationships between human actions and the environment.
- (3) Environmental education should be integrated into all school curriculums.
- (4) Diverse environmental education opportunities should be available to the general public.
- (5) Environmental education should be a cooperative venture, coordinated at all levels within the state and with national and international networks.

The fourteen objectives had specific recommendations for implementation. For example, Objective 8 is, "To provide training in environmental education as part of pre-service and graduate level teacher's course work." In total, the Task Force made 92 action recommendations.

Arizona isn't alone in taking statewide action to either define or develop an environmental education program. Kentucky, North Carolina, Wisconsin, Nebraska, and others have, or are working on, various plans or definitions designed to increase the teaching and implementation of environmental education in the public school system.

Illinois, Ohio, Wisconsin, and many other states have established state offices of environmental education, usually within the Department of Education. In addition, interagency committees have been established in numerous states, and many Native American (Indian) Nations have established Tribal Council Offices for environmental activities, including education.

Pre-service Education

Some states are now designing college courses specifically to address the content and pedagogy of environmental education, while other states are incorporating environmental education into existing teacher training courses. A program might follow a competency-based model, such as in Wisconsin, which delineates a comprehensive set of competencies that must be achieved prior to teacher certification in science, social studies, agriculture, early childhood, and elementary education.

These competencies include knowledge about natural resources and their conservation; interactions between the living and non-living elements of the natural environment; concepts of energy and its transformations in physical and biological systems; knowledge of the local, national, and global interactions between people and the natural environment; ability to examine the values and attitudes inherent in environmental problems; ability to incorporate the environment into all academic subjects; and how citizens can participate in the resolution of environmental problems.

Delaware requires three semester hours in environmental education, with adequate course work being defined as including history and philosophy of the conservation movement; understanding the variety of natural resources; relationships of natural resources and economic structure; importance of resource conservation in a national and international setting; natural resource management techniques; and the importance of natural resources for the future.

The American Society of Testing Materials has formed a committee that has been subdivided into four topical areas now working on various aspects of environmental education, including one to develop standards for environmental education.

The Council of State Governments, representing the governors of all 50 states, formed a committee to begin the process to develop model legislation for environmental education. To have this organization take an active role in environmental education, which has the potential for replication across the nation, speaks well of the attention that environmental education is now receiving. Early drafts of the legislation are rough, but it is moving in the right direction as an expression of the need for state-level environmental education legislation.

In 1986, the National Geographic Society, in cooperation with TERC and other organizations devoted to improving science and mathematics education, launched the Kids

Network. The Kids Network is about three sciences -- life, earth and physical. Its about inquiry, and how scientist work.

The program has been divided into three general areas: investigating, dealing with data, and using technology. And, since children learn by doing, in the Kids Network they will collect data through direct experiences, by using their senses in hands-on experiments; by using instruments and tools; by reading maps and making graphs; by observing and recording changes over time; and by conducting surveys.

Students will analyze the data they collect by making comparisons, looking for patterns, forming hypotheses, testing hypotheses, discussing implications, and drawing conclusions. Finally, by using the computer -- as a tool not as a teaching machine -- students will write letters to each other; display and manipulate data in the form of maps, tables, and graphs; and exchange data with each other via telephone modem.

Each Kids Network unit will introduce children to an important branch of science, such as meteorology, ecology, hydrology, or soils, and to a specialist in that field. Students will make and use their own tools, learning that technology is the application of scientific principles to human needs. In each unit, classes also discuss the social implications of scientists' work.

Five major themes have been identified -- patterns and change, systems and interactions, energy, evolution, and stability. Each unit will address several of these. For example, the earth science content of the "What's in Water?" unit would ask: What is the water cycle? What is a watershed? What defines our own watershed? What is groundwater? How can it become contaminated? Where does tap water come from? And, the Kids Network is here in Italy.

U.S. Environmental Protection Agency (EPA)

On November 16, 1990, President Bush signed into law the National Environmental Education Act. It requires the US Environmental Protection Agency (EPA) to assume leadership among federal agencies in implementing the new law, and encourages partnerships among federal agencies, local educational institutions, state agencies, not-for-profit educational and environmental organizations, and the private sector.

The eight major components of the law are:

- (1) Establishing an Office of Environmental Education within EPA;
- (2) Establishing an Environmental Education and Training Program;
- (3) Allowing EPA to enter into environmental education grants and contracts;

- (4) Requiring EPA to facilitate internships for college students and fellowships for in-service teachers with federal agencies;
- (5) Providing for national environmental education awards;
- (6) Establishing a Federal Task Force and a National Advisory Council to advise, consult, and make recommendations regarding implementation of the Act;
- (7) Requiring the establishment of a National Environmental Education and Training Foundation that will encourage private gifts for the benefit of environmental education; and
- (8) Funding the Office of Environmental Education through 1996.

The first major activity of this new office was to stage an environmental education conference last fall. Recently, about \$2.5 million in grants were being distributed to organizations that successfully competed for them at the regional and national levels.

Extension Service and the 4-H

Since 1988, the Extension Service, an agency of the U.S. Department of Agriculture, and 4-H, a youth organization, have been working on revising their approach to environmental education. In the fall of 1988, the first national meeting was held for 250 volunteers and professional 4-H leaders. Following that meeting, four regional meetings were held.

A similar format was followed for each meeting, with four or five major environmental areas taught and facilitated by resource specialists in soil, wildlife, waste management, water, forestry, and other topics.

At the end of September in Washington, D.C., the final national meeting will be held where a new concept towards environmental education will be presented to 250 4-H and Extension leaders. Called the Core Program (not to be confused with the National Science Teachers Association's CORE Content program), this one will direct all youth, ages 6-11, entering the 4-H program to go through a Core Program, ensuring that they begin their 4-H experiences by receiving the same information and concepts. The Core materials contain universal concepts applicable to natural resources and the environment.

The program focuses on experiential activities and looks at such broad topics as interrelationships, stability and change, human responsibility, and respect for the balance of nature.

A new publication called ENVIRONMENTALS will soon be available. It will provide interesting stories and activities that demonstrate the environmental concepts and principles the coordinating committees and advisors have discussed and field-tested.

Soil Conservation Service, U.S. Department of Agriculture

Naturally, I saved the best for last and will focus on two efforts of my agency, the Soil Conservation Service -- or SCS.

We are reorganizing our environment education efforts and reviving one of our most successful educational and conservation activities, outdoor classrooms or learning areas.

For many years, SCS assisted formal and non-formal education through the design and development of outdoor classrooms on school property. Thousands of these facilities were built over many, many years. Unfortunately, as agency priorities changed, mandated by legislation, this activity, never officially sanctioned as a priority and never reported on our local offices' annual reports, declined in importance. Nevertheless, many employees continued to help schools establish outdoor classroom facilities.

Recently, we've decided to make this a focus of our educational effort and are now developing the criteria and procedures to assist our 3,000 local offices to again reach into the educational community and help establish outdoor classrooms.

We use the term "outdoor classroom" when it is associated with a formal educational institution, and "learning area" when describing a site that is part of a non-formal educational organization, such as Girl Scouts and Boy Scouts, or on government-managed land.

Through the outdoor classroom/learning area concept, we hope to encourage the development of a conservation plan on all school sites and on properties owned and managed by cooperating organizations. These facilities will encourage the use of the out-of-doors by students. And since they are on or near school property, the school system will save money because they will not have to charter busses for long-distance field trips.

Outdoor classrooms will encourage a community spirit toward the school and foster student, teacher, and citizen awareness and understanding of the local natural resources. And the outdoor classroom/learning area will become a source of supplemental education experiences in topics not directly-related to the environment, such as music, dance, art, literature, and so forth.

All-in-all, outdoor classrooms/learning areas will offer educators a great educational resource that doesn't have to cost any money to develop. All it will take is recognition of the environmental and human resources that are already available on the school site, and using them in an interdisciplinary environmental education program.

Snotel

For more than 50 years, SCS snow surveyors have traveled by airplane, overland vehicles, skis, and snowshoes to measure the depth and record other information about snow in the mountains of the American West. We also use automated equipment at more than 600 sites, where solar powered stations with a host of electronic equipment, automatically record site-specific data, then send that information to base stations, by bouncing radio signals off meteorite bursts in the atmosphere.

To link this exceptional technology to its many educational potentials, SCS developed its Adopt-A-Snotel Site educational program in the late 1980's. With a computer and modem, teachers are able to link with the SCS snow telemetry data base and use that information for classroom activities. "Adopt" teachers sign a simple agreement, which brings them on-line and links them to an automated snow telemetry site nearby. The students, under supervision, may visit the site, but will also do snow sampling, learn about cold weather survival, and many other interesting activities, in the classroom and on the school site.

In North Pole, Alaska, one school is so proficient at snow measuring that their data is considered official by the SCS, and is entered in our permanent data base.

What the students are learning is more than simply how to survey snow. They learn how one unit of government works, to be involved in a fun and rewarding activity, gain important career information about one aspect of the natural resources professions, and gain valuable hands-on learning experiences.

The students are involved in "real-world" data collection -- tasks that aren't simply classroom exercises, but ones requiring dedication, perseverance, and accuracy. The program not only helps fulfill the need for accurate and timely data for future water management decisions, but also involves students in meaningful and educational tasks.

CLOSING

Some educational principles and concepts are fairly universal and could be applied to schools in most locales. Although science is stressed, it must be abundantly clear that, according to the National Science Teachers Association, "all academic topics are and should be included in any study of environmental topics or issues."

What is the status of environmental education in the United States? Simply stated, depending on where you are, it is either OK, good, great, or non-existent. By these few brief overviews, it is clear that many organizations are involved and are doing something in environmental education. Overall, I believe we are seeing environmental education grow and prosper, although what we in the business call environmental education may not be how others identify their efforts. We must be alert to those who call their programs environmental education when, in fact, they are not.

What we must do is strive to reach common goals and objectives. Among them, I believe, is stressing environmental and human interrelationships; infusing the environment into all academic topics; making sure that environmental education programs are educational, not pushing a particular point-of-view; to teach about all natural resources equally; to reorient teacher training to produce teachers who are better equipped to infuse the environment into all topics; to make teachers aware of the many resources available to them from government agencies and private organizations; and to articulate clearly the result of environmental education . . . that being, citizens with an awareness, understanding and commitment to personally act in an environmentally-responsible manner.

Two comments made by relatives come to mind. First, my elderly uncle from Germany, visiting the United States 12 years ago, was walking through an Iowa corn field. He bent down, picked up a handful of that rich, black, aromatic earth, and said, "You must take care of this. We've been farming our soil for hundreds of years longer than you, and the soil is worn out". He was right . . . we overlook our soil and other resources because they are all around us. Many of us don't take care of them as we should because we focus on other, more pressing matters in our daily lives.

Recently, my mother said as we traveled through western North Carolina, "The world sure is beautiful." And, indeed, it is . . . the sun, the flowers, the soil and water, animals, grass, snow and rain, the sky . . . all those components that we, as humans, need for survival.

We need the environment . . . but the environment doesn't need us. All of us breathe the air, use water, and must have food and shelter. And every one of those items trace their origins back to soil, water, plants, light and air . . . the very things that we take so much for granted.

As educators, professionals, citizens, and students, we must share our enthusiasm and knowledge about the environment and all it holds. We need to instill and build on the sense of wonderment and amazement that the natural world holds for most people. Environmental education is but one method that may be used to reach that goal. The important thing is to reach, and to keep reaching for that goal.

No task is more important than making the future better than the past. How we participate in that effort will help determine the future as we adults soon relinquish world, national, and community leadership to the children of today.

Thank you.

* * * * *

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